STATE OF WASHINGTON

"TURNKEY" APPROACH TO STATEWIDE DATA CENTER

A10-RFI-055

Welcome to the State of Washington

Washington State Department of **Information Services**

ACADIA Private Cloud Solutions

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July 2, 2010

Rebekah O'Hara
Department of Information Services
Office of Legal Services
1110 Jefferson Street SE
PO Box 42445
Olympia, WA 98504

Reference: Request for Information #A10-RFI-055

Dear Rebekah O'Hara,

Acadia, EMC, Cisco and VMware, are pleased to submit the attached response to the referenced RFI #A10-RFI-055, "Turnkey Approach to Statewide Data Center."

Acadia is a joint venture of Cisco and EMC, with investments from VMware and Intel. Through the work that EMC, Cisco and VMware have engaged in with the state over many years, and the investments that DIS in particular has made in the technology of Acadia's parent companies, we have a strong base of knowledge of the DIS environment. We'll leverage this knowledge to create a turnkey approach to providing services to your many customers, that will enable you to improve your service quality, significantly lower your time to serve, and at the same time reduce your cost to serve. These benefits are achieved through the integration of best-in-class technology throughout the data center, and by applying proven methodology in service creation, delivery and management.

Acadia is focused on ensuring that technology investments made today continue to deliver value for many years to come via our unique "Built, Operate and Transfer" model, which ensures you can rapidly deploy services to your constituents, with a path to taking over full operation and ownership of the environment on your timeline.

We are looking forward to working with the state to help create fast, efficient, and cost-effective solutions that take advantage of your new data center and the knowledgeable and skilled employees you have in place today. If additional information is required please contact Corilynn Bailey for all business-related questions.

Respectfully submitted,

Corilynn Bailey
Acadia Solutions, LLC
Business Development Manager
972-658-8838

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EXECUTIVE SUMMARY

Acadia, along with VMware, Cisco and EMC, is pleased to provide this response to your Request for Information. Based on the vision you have created in the RFI, we believe that Acadia is perfect fit for helping you deliver on that vision.

Acadia is a joint venture of Cisco and EMC, with investments from VMware and Intel. Acadia leverages integrated technologies and innovations from its parent companies to simplify the transition to private cloud operations. After operating a customer's virtualized environment for an agreed-upon, limited amount of time, Acadia trains the customer in the standardized methodologies and tools needed to continue to optimize performance, efficiency and agility— and transfers operations to the customer.

Server virtualization began as a way to squeeze higher utilization and more efficiency out of existing server assets. But it has evolved to become the foundation for a new way of building and delivering enterprise IT – the private cloud. Acadia was created to help our customers accelerate their adoption of the private cloud, and the benefits it delivers, including:

- Dramatically lower IT costs, via large-scale consolidation of resources and much higher utilization rates.
- Significantly reduce "time to deliver" for your customers – the time it takes for IT to provision and deliver a new service to a customer.
- Introduce easy-to-use self-service capabilities, via VMware's Redwood technology, to empower your customers to provision, manage and monitor services via automated tools, just as they would with an outside service provider.
- Deliver and maintain a service catalog that is the foundation for service provisioning, and is based on service levels, rather than physical hardware/software assets.
- Provide built-in multi-tenancy to allow different customers to benefit from this highly efficient and secure "pod" architecture.
- Reduce risk by relying on technology that is purpose-built for the private cloud, and methodologies that are proven in the field.
- Greater consolidation will enable greater re-use of data across the state, so that it is stored once, but leveraged by different entities, if you choose.
- Enable massive and rapid scalability, so that Wheeler can accommodate all of the public and non-profit entities for whom DIS can provide service.

In short, Acadia will help the State of Washington to transform your IT infrastructure, without putting your IT dollars – or your business – at risk. And we will do so in your new Wheeler Data Center, where your assets will be secure and in your control. Acadia was created to help our customers accelerate the adoption of the private cloud, transfer knowledge along the way, and then turn it over to you when you are ready.

We hope the following response helps provide guidance to an outstanding third option for the state – an option that leverages the expertise and proven solutions of VMware, Cisco and EMC, but does not turn your data center and business over to a third party. We look forward to

working with you to deliver a private cloud that will benefit all citizens of the State of Washington.

BUILD, OPERATE, TRANSFER

Services are a vital component of successful data center deployment. Cisco, EMC, VMware and Acadia are uniquely positioned to complement the in-house expertise of our customers with our specialized technology services. These services can and should be used during all phases of the data center lifecycle, as discussed below.

SUPPORTING MISSION REQUIREMENTS THROUGHOUT THE NETWORK LIFECYCLE WITH DATA CENTER SERVICES

Acadia, Cisco, EMC, VMware and deliver data center networking services using a lifecycle approach: Preparing, Planning, Designing, Implementing, Operating, and Optimizing (PPDIOO). The lifecycle services approach specifies the requisite activities at each phase of the network lifecycle, offering a services framework that applies regardless of who performs the service activities, whether it be vendors, partners, systems integrators, or the customers themselves. This framework enables multiple parties to provide the support needed in a coordinated manner.

The network lifecycle is a beginning-to-end view of the continuum of events that takes place in the network lifespan. Through a broad portfolio of targeted end-to-end services, Cisco, EMC, VMware, Acadia and their partners can help you achieve and exceed your business goals throughout the six phases of this lifecycle.

Figure 1.   The PPDIOO Lifecycle
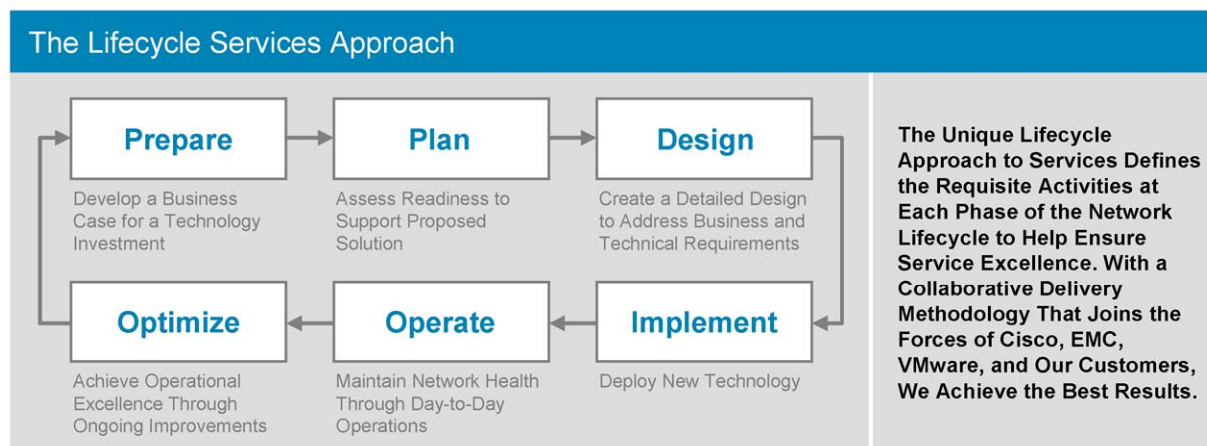
PREPARE

Develop a data center technology vision that aligns with your current and future requirements. Review new technologies that can help you meet mission goals. This review can include the alignment of mission and IT strategy, current state and future requirements gap analysis, and project management to oversee the service engagement.

IMPLEMENT

Rapidly deploy the data center architecture and solutions in a new data center. Implementation services include:

- Implementation/migration project plan development
- Equipment installation and testing
- Configuration, connectivity, and interoperability testing.

OPERATE

Operate services include access to technical assistance centers, break-fix troubleshooting support, software patch and upgrade privileges, hardware replacement, and access to online tools.

OPTIMIZE

Optimize services help address evolving requirements in the data center. Optimize services can be used to:

- Improve network performance, availability, security, and QoS
- Adopt and combine technologies to create a data center network that evolves continuously
- Proactively address potential data center issues

Achieve and maintain a comprehensive, end-to-end data center optimization solution.

PROVIDER RESPONSE OUTLINE

Section 1 – Conceptual Alternatives

Briefly describe the essential characteristics of your approach to this "turnkey" strategy to the statewide data center. Highlight elements of the proposed model that would make it particularly attractive to the state and elements that will make it particularly difficult to implement.

Acadia Response: The true value of virtualization is in its potential to transform the way that DIS provides services to your customers. That's because virtualization also enables encapsulated, portable workloads that can be copied, versioned, moved, and replicated with ease. This modular manipulation of workloads opens the door to new and accelerated business services that will allow DIS to be more agile and responsive to the needs of your customers. More granular resource allocation will also enable DIS to extend greater visibility, and greater management capabilities, and greater accountability, to your customers for the resources that they consume and expenses they incur.

Combined with the ability to pool and share resources, self-management and charge-back capabilities open new possibilities for eliminating many provisioning costs and delays of the traditional data center. vCloud Service Director, codenamed Project Redwood, is a set of VMware technologies that provide the interface, automation, and management tools to tie VMware environments in the enterprise into private clouds, and to link them seamlessly with outside service providers. vCloud Service Director will allow DIS to create a fully-functional internal cloud infrastructure that will let users serve themselves by creating, using, and managing virtual machines, while DIS maintains control and bills for usage.

Acadia's approach to enabling DIS to become the Private Cloud for the state, then, is much more than a new kind of operating software that delivers a one-time cost-benefit through greater utilization of physical infrastructure assets. It enables a fundamentally new way for IT and businesses to operate, with on-going reduction of costs, improvement of service levels, and greatly improved time-to-serve your customers.

Acadia provides a unique advantage to State of Washington in that they are an umbrella organization to VMware, Cisco and EMC. As a result, DIS would benefit from the existing relationships with each of the vendor's representatives and resources, and the familiarity with our solutions, technology and long-term strategies.

Our specific approach to ensuring rapid success in delivering a private cloud for the State of Washington includes several key steps:

ROADMAP TO SUCCESS
1. Conduct an infrastructure assessment to quantify the opportunity
2. Assess operational readiness
3. Assess business objectives and develop goals that reward all stakeholders
4. Develop a strategic implementation plan
5. Implement plan over time with identifiable wins
6. Include all stakeholders
7. Market your success internally

Specific advantages to the Acadia approach include:

- Accelerate the deployment of the State of Washington Private Cloud, to lower costs and improve service levels for the delivery of IT as a Service throughout the state
- Dramatically reduce the number of physical servers required to provide services
- Reduction or flattening of Human IT resources through the consolidation of Storage, Compute and Network resources
- Reduction in the amount of time to provision virtual machines, from weeks and months, to minutes
- Increase the utilization rate of servers significantly (on average, servers consume about 4.5% of processor resources today)
- Reduce monthly recurring costs for power and cooling, in addition to reducing data center footprint
- Reduce the amount of physical networking connections required to deliver services
- Delivering to end users specific qualities of service based on service catalog definitions, with pricing tiers based on consumption of these service levels
- Providing a pay-as-you-go consumption model transforming CAPEX expenditures to OPEX

Challenges:

Capitalizing on the full potential of large-scale virtualization requires new kinds of thinking and efforts that go beyond purchasing and installing new software. The development of new processes, tools, internal marketing, and training may not be easy, but evolution is not an option.

The cultural shift to aggregating pools of resources together to take advantage of large-scale virtualization will likely be a larger hurdle than any technology challenge. Whether in public sector or private sector, consolidation and virtualization efforts typically evoke a positive response in general, but a "Yes, but I'm unique" response at the business level. Addressing this organizational concern – through collaboration, well-designed architecture, proven solutions, detailed planning, and some good internal marketing – is key to successful implementation.

With 100 percent of Global 2000 companies engaged in virtualization implementation, it's a competitive necessity. Acadia's role in this process is to accelerate adoption, reduce risk, and to provide knowledge transfer to DIS so that you can take over operations of the environment as quickly as possible.

Section 2 – Responses to Questions Regarding the Overview

Briefly address each of the four (4) questions in the Overview section. The questions represent threshold issues: is this approach worthy of further consideration? What issues might be relevant to deciding whether to put further effort into pursuing this direction?

OVERVIEW OF THE ALTERNATIVE

1. What are the financial, legal, and operational advantages and disadvantages of the model under investigation relative to a fully state run transition and operation? Are there unique telephony issues about which we should be aware?

Acadia Response: The VMware, Cisco and EMC (VCE) coalition have invested considerable research and development resources into the development of architectures and solutions to cost effectively accelerate the adoption of private cloud computing. The initial architecture released by the VCE is the Vblock. Implementation of the Vblock affords the State of Washington the benefit of this R & D engineering and testing to enable a quick implementation of a pre-configured virtualization platform inside the customer data center. The consolidated Vblock is easily managed through the Unified Infrastructure Manager UIM orchestration software significantly minimizing the number of technical support resources required to support a similar number of servers physical in the existing data center. The numbers of network, server and storage administrators is reduced through standardized infrastructure and automation tools and workflows.

One subtle legal advantage comes in the form of RCW 43.105 which allows the state to provide (full cost-recovery) services to any public or non-profit entity. A vCloud environment enables DIS to uniquely deliver compute, disaster recovery and other shared services to these organizations.

Acadia will provide The State of Washington a single legal entity to provide the full end-to-end product and services solution for the centralized data center. This will eliminate the need to contract and interface with each of the VCE parent organization separately for delivery and ongoing support of the Vblock and related build, operate and transfer services. When you're ready, we empower you to take control of your operations.

And while the CAPEX benefits of virtualization are abundant, the OPEX savings are even greater, through the more efficient management of virtualized infrastructure. As the state consolidates more and more IT resources to Wheeler, being able to scale out services without scaling out personnel resources linearly will enable the state to realize the efficiencies and cost savings of consolidation.

Following the transfer of ownership, the VCE/Vblock environment is supported within a single support center, staffed by VMware, Cisco and EMC employees – with one support phone number.

Cisco is uniquely qualified to support the State's voice infrastructure within the data center. Cisco provides both the call control and the data center servers required to support voice services. This unique combination of data center and Unified Communications is running at many customers. The solution allows customers to closely integrate servers on a high-performance SAN, reduce the time to upgrade the voice solution, and quickly provision servers

for scaling services. The unique telephony issues to consider include sizing call control servers and hardware to meet the migration schedule of the State of Washington. The second consideration is ensuring the data center network can support Quality of Service (QoS) tagging for call control signaling.

2. How would this deployment strategy address unique aspects of the centralized state data center, such as security concerns and disaster recovery? For background on state standards, see the Information Services Board: http://isb.wa/gov/policies/Default.aspx

Acadia Response: Please find below the security and disaster recovery aspects.

SECURITY ASPECTS

The implementation of a multi-tenant virtual infrastructure simultaneously improves and complicates security. Three main security requirements would be addressed: (a) Access control; (b) data separation; and (c) network segmentation. Whereas these are existing constructs within the VMware vSphere environment, the Acadia team would necessarily work from pre-existing policy and logical design documentation. When an individual agency identifies the need for a new (virtual) server or desktop, the approver would be prompted to provide the appropriate environmental variables (admin and access team; network VLAN segment). Meanwhile, storage location is automatically associated to the specific agency or department.

Implementation Of These Security Principles Would Utilize These Key Features:

- **Access control** - Access to individual (virtual) server / desktop virtual machines utilize pre-existing access controls either through LDAP or Active Directory.
  Acadia and DIS personnel would manage the underlying architecture, including placement of virtual server(s) and visibility on SGN network – but, not login access for agency virtual servers. Administration is limited to creation, power operations (on/off/reset), and end-of-life destruction of said server(s).
  Logging and Audit. Machine management and VM administration is controlled and audited from within a centralized console (aka "vCenter"). Access and activity specific to an individual server or desktop system is audited/logged using pre-existing mechanisms with no changes required.

- **Data Separation**- For a multi-tenant virtual infrastructure, it is assumed that agency data would be stored on a shared SAN/NAS array. Access control to individual volumes (aka "LUN") can be accomplished in one of two ways. A simple option is to specify and assert access control lists on a per-volume basis. A secondary option (currently under consideration within DIS) is to implement full data separation by volume using physical (or virtual) LAN segments as a security boundary.
  An emerging logical design from DIS (anticipated in Q3 2010) will define this level of data separation.

- **Network segmentation** - Requestors of new (virtual) server or desktop systems are able to choose a specific "port group" when placing a machine. Only port groups associated with an agency or department are visible to the requestor. Port Groups are pre-defined, based on network policy documentation (also emerging in Q3 2010). These are asserted

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via a construct known as a "virtual switch" within the virtual infrastructure. Network policies, port statistics and VM tracking would be asserted using Cisco Nexus OS ("NOS") through a network supervisor attached to each physical host. This is commonly referred to as a "Nexus 1000v" distributed switch.

DISASTER RECOVERY ASPECTS

Because of the underlying nature of virtualization, an individual server or desktop system is stored and accessed as a file folder on shared storage. This is known as encapsulation, and serves as a strong basis by which to deliver an inexpensive mechanism for long-term disaster recovery. Although encapsulation is useful for near-line backup/recovery, the concepts for crisis-related disaster recovery will differ slightly.

It is assumed by the Acadia team that both "near-line backup" would be a requirement for implementation. However, this would be provided on an as-requested (including chargeback) basis during server or desktop request.

Similarly for Disaster Recovery – a requestor may choose to implement one or more levels of disaster recovery. This assumes a separate facility to capture workloads that fail over in the event of a crisis.

Design architecture for disaster recovery would include these important components:

- Identification of protected machines.
- Recovery Point Objective (RPO: how much data can be lost in a failover – measured in minutes/hours/days)
- Recovery Time Objective (RTO: a prioritized list used during failover – dictates minutes/hours/days before a system must be fully recovered and operational)
- Storage LUN or Volume replication (between physical sites)
- Automated runbook requirements
- Contact information, roles and responsibilities during crisis.

Acadia would assume responsibility to prepare and manage a recovery site. Similarly, during (a) failover/recovery testing and (b) an actual crisis response, Acadia would presume to manage a failover and failback events. Acadia would work with named contacts for individual agencies or departments during this time.

Because the size, timeframe and extent of failover testing, this would represent a separately negotiated charge and would be scheduled with an individual agency. A crisis response (failover/failback) is considered a separately charged event, based on pre-negotiated pricing.

3. What scale of operation would be required for this alternative to be attractive to potential bidders on any future RFP? Is there a critical mass below which you would not be interested in bidding on a proposal for this approach? What metrics would capture that decision?

Acadia Response: Acadia's value proposition is maximized when leveraged across the enterprise' and can scale quickly once adopted inside the centralized data center. The Vblock architecture is designed to bring increased efficiencies across an enterprise with additional

volume and scale. Ideally, for an enterprise to gain the most benefit from the Vblock solution, a baseline volume of 300 to 500 virtual machines should be considered with 20 to 30 TB of associated storage. Value is optimized when volumes exceeding 1000 virtual machines are reached within 12 to 24 months.

Acadia is not looking for a point solution limited to remote or regional data centers but focuses on the enterprise data center. Volumes below the baselines mentioned above would significantly limit the value the Vblock solution could provide to the State of Washington. Our financial analyses have shown reasonable return on investments (ROI) periods are difficult to reach when the enterprise virtualization programs target less than 500 virtual machines deployed on the Vblock over a two year period.

The metrics required to capture this decision are the number of datacenters, number of x86 and Linux servers to be virtualized, types of Operating Systems as well as the current amount of storage. This information will enable us to determine the capacity and number of Vblocks required to meet the needs of the States data center consolidation program.

4. What intellectual property issues, if any, would limit the state's ability to pursue this approach? Any proposed solutions must be based on the appropriate technical solution and equipment as opposed to the lead vendor's default proprietary solution.

Acadia Response: When implementing and operating complex Data Center solutions there will always be a large amount of intellectual property developed. We would expect these documents to contain, but not be limited to, operational procedures, as-built designs, implementation documents, and technical solutions. As part of the agreement between Acadia and DIS all of these documents would be the intellectual property of DIS and not Acadia. While building solutions for DIS we would expect to use industry standard products based on open standards that would not have a proprietary nature to them.

At times it is necessary to have design discussions with vendors about proprietary solutions. These solutions typically start as proprietary and quickly move to open and standardized. During this transition time Acadia will ensure that we are able to work with both DIS and the vendor to ensure that all parties can communicate openly and in a manner that would best serve DIS and the customer solutions.

Section 3 – Responses to Questions Regarding the Transition

Briefly address each of the four (4) questions in the Transition section of the RFI description.

TRANSITION ISSUES

5. Given the current decentralized allocation of resources, what role would the transitional data centers in agencies and the statewide data center in Office Building 2 play in your proposed alternative?

Acadia Response: The Acadia solution would become the State's preferred target location for virtual servers (VMs) from the current statewide data center in Office Building 2 and the individual agency data centers. Acadia, working closely with DIS, would accelerate this transition by the creation of price competitive hosting offerings for these virtualized systems – including offerings to address networking with interdependent systems, and security and compliance requirements to meet the wide range of requirements across agencies (including those with Federal requirements for segregated environments).

The Acadia team would also offer services to migrate these virtualized environments from their current systems onto the new hosted environment. And, Acadia could also extend these services to related non-virtualized, non-x86 environments, which need to be migrated in concert with the virtualized applications. EMC VMware and Cisco have led many hundreds of such data center migrations, across virtually all application and hardware types, with the industry's most well developed methodology and tools to eliminate risk and ensure successful migrations with no unplanned downtime.

6. What is a potential timeline for the transitioning of decentralized assets to the data center, equipping of the center, start up of the joint asset, initial operation and training of state employees, and transition of the data center to full state ownership and operation? How would the vendor establish the timeline and what elements would be needed to accurately develop a timeline?

Acadia Response: The transition timeline is dependent on the amount of data, number of servers and sensitivity of the data to migrate. The Vblock infrastructure will be available for these types of migrations. Acadia will tailor our operation and transfer phase to facilitate the clients timeline, however depending upon the scope of the State of Washington's infrastructure, the engagement can range anywhere from 6-12 months or longer.

The transition timeline will primarily depend on the scale of migration and data center consolidation to include: the number of servers, storage, and locations of remote and target datacenters. The figure below shows a typical Acadia deployment timeline. Each specific engagement transition timeline is tailored to the specific business requirements of that client engagement.
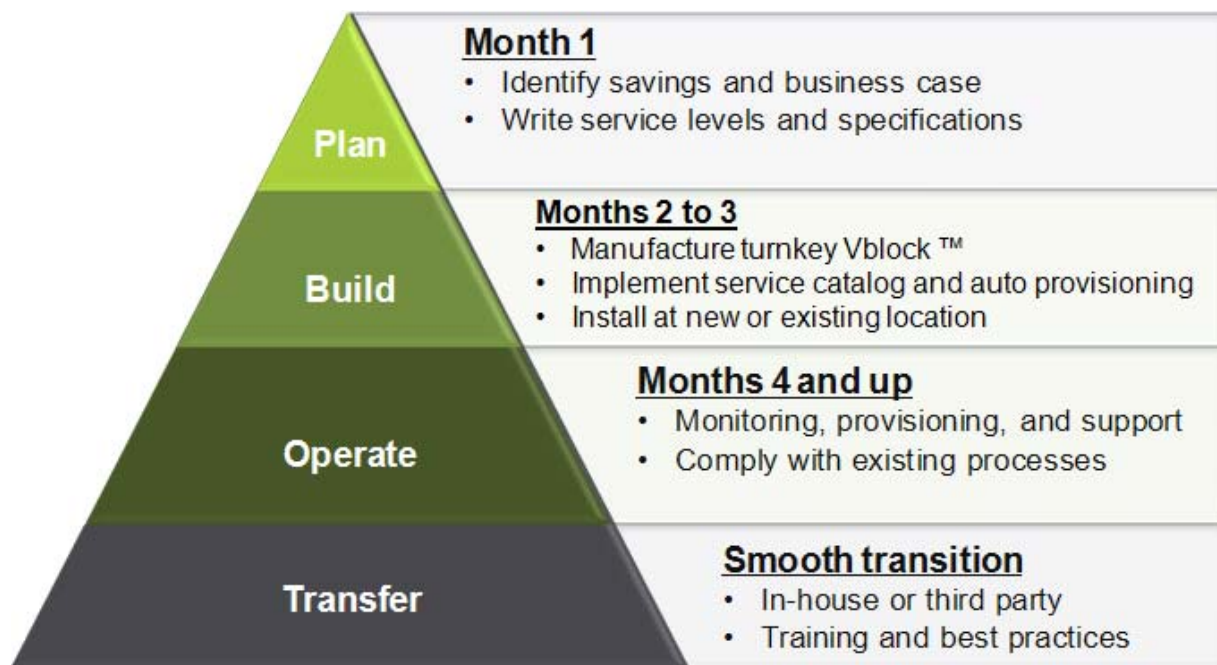
7. How would this approach best align or integrate existing legacy systems and mainframe operations with the proposed private cloud for the public sector? How would a vendor handle the continued coexistence of legacy and modernized solutions in transition?

Acadia Response: Cisco, EMC and VMwares's approach to legacy application integration creates a business architecture that treats applications as assets to be leveraged. Integration is accomplished by gradually migrating to a service-oriented architecture (SOA). Modernizing legacy systems using SOA can be a key strategy that helps a company meet the increasing demands of the business while maintaining its large investment in legacy systems. It can also provide a stepping stone within the roadmap for the eventual retirement of outdated systems. SOA does not have to be an all or nothing proposition. Rejuvenating legacy systems can help companies provide modern tools to their customers without taking on the risk of a long term and expensive "rip and replace" approach.

The most common method to integrate with legacy systems (mainframe, midrange) is through X86-based middleware solutions. Custom development, testing, and deployment within a virtual infrastructure is rapid and cost effective.

SOA and cloud computing share many common principles, but also differ significantly in their role in IT architecture. SOA is mainly an application architecture with horizontal services; while cloud computing is an IT architecture with vertical services. Given the differences, SOA and cloud computing complement each other very well.

The Vblock would integrate into the service management processes that are currently in use by the legacy (mainframe) environment. The Vblock can operate alongside existing legacy systems and through API's and can be managed by the same Enterprise Systems Management (ESM) and ITIL based service management processes.

8. What purchasing and technology decisions might be made now that would limit or enhance the potential for this alternative?

Acadia Response: Acadia has direct purchasing agreements and direct relationships with VMware/EMC/Cisco. Acadia has the ability to escalate to expedite procurement lead times and product delivery with the manufacturing and fulfillment organizations.

Cisco, EMC and VMware all have current proposals up for consideration with DIS that are related to the State Data Center. Each of these proposals already leverage existing investments made by DIS and other State Agencies, and they complement the proposed alternative.

- **Cisco**: Unified Compute (blade servers), Security
- **EMC**: Symmetrix VMAX storage, Avamar, Data Domain
- **VMware**: Vsphere, Virtual Desktop, and VCloud Services Director (Redwood)

All of these technologies fall under the Virtual Computing Environment (VCE) Coalition, and represent an unprecedented level of collaboration in development, services, and partner enablement that reduces risk in the infrastructure virtualization journey to the private cloud.

VCE's Vblock Infrastructure Packages deliver a complete IT infrastructure that integrates best-of-breed virtualization, networking, compute, storage, security, and management technologies. The three companies have invested in industry-first collaborative delivery of seamless customer support with end-to-end vendor accountability.

By implementing a Vblock infrastructure, you get the best of Cisco, EMC and VMware through the services of Acadia. Acadia—a joint venture of Cisco and EMC, along with VMware and Intel—focuses on speeding adoption of private cloud infrastructures through end-to-end enablement of service providers and large enterprise customers. Acadia's unique 'build, operate, transfer' model for delivering Vblock architecture, addressing people, process, and technology, will offer DIS further choice, flexibility, and cost advantages as they seek to virtualize their IT infrastructures and evolve to the private cloud.

Section 4 – Responses to the Financial Discussion

Briefly address the question in the Financial Section of the RFI description. Please highlight any unique strategies or capabilities that you would provide to make this effort successful.

FINANCIAL ISSUES

9. What unique financial models might be necessary or advisable to maximize taxpayer value through this alternative deployment strategy?

Acadia Response: Acadia can provide virtualized data center services though unit costs for single virtual machines or (VM's). Consumption of Vblock and Acadia resources can be delivered to the State in a variable 'pay-as-you-go' model eliminating high CAPEX expenditures and transforming them into operating expenses (OPEX). This approach better align costs with actual resource consumption reducing underutilized compute and storage resources.

A vCloud environment enables DIS to uniquely deliver compute, disaster recovery and other shared services to these organizations (RCW 43.105 allows the state to provide (full cost-recovery) services to any public or non-profit entity).

Section 5 – Cost and Schedule Estimates

The Department realizes that the proposed alternative is being presented in the most general terms. Yet there are essential elements of the model that lend themselves to reasonable cost estimates. Please provide cost information that will allow the Department to evaluate the potential for the proposed approach. Given the limited detail available for your response, respondents are welcome to provide ranges or costs, rather than specific dollar estimates.

Section 6 – Corporate Expertise

Briefly describe your company, your products and services, history, ownership, financial information, and other information you deem relevant.

In particular, please describe any projects you have been involved in that are similar in concept to what is described in this RFI, including design, management and operations approach, training provided, security assurance, relevant lessons learned, timeline to go from concept to production, and financial capacity.

Acadia Response: Please find below the 4 company overviews, starting with Acadia.

Acadia overview

Acadia

Corporate Headquarters

5050 Quorum Drive
Suite 540
Dallas, Texas 75254
United States

For Acadia's executive organization and biographies, please visit:

http://www.acadia.com/acadia/board/index.htm

ACADIA is a joint venture, founded by Cisco and EMC, and further capitalized by investments from VMware and Intel. The venture was established to help partners and customers accelerate the transition to pervasive virtualization and private cloud.

ACADIA offers a simpler, more streamlined approach to IT transformation by leveraging best-of-breed technologies from the three parent companies which form the VCE Coalition: Cisco's leading-edge networking and compute technologies; EMC's expertise in storage, security, and management; and VMware's unparalleled virtualization technologies capabilities.

We provide the field-proven expertise needed to fully deploy and optimize these technologies in your unique environment, including standardized tools and best practice methodologies for ensuring optimal efficiency and performance. We significantly reduce your risk, cost, and time-to-value by initially operating the environment for you, for an agreed upon period of time. When you're ready, we empower you to control your operations and your future.

ACADIA RESEARCH AND DEVELOPMENT

To unleash the full value of cloud computing, ACADIA offers a best practice blueprint for building, integrating, and operating the Vblock infrastructure in enterprise data center environments.

- **Rapid Deployment**- We accelerate and simplify deployment of the Vblock infrastructure with pre-built and tested components and complete onsite installation, configuration, and performance tuning.
- **Optimum Performance** -We ensure that you realize optimum performance, efficiency, and agility by putting in place ITIL-based operational best practices and management

tools finely tuned for your next generation virtualized environment. And, we significantly reduce your risks, costs, and time-to-results by initially operating your environment for you for a limited, agreed-upon period of time.

- **Seamless Transfer- Finally**, when you're ready, we provide you with all the tools and training you need to take the reins.

END-TO-END ACCOUNTABILITY

We also ensure end-to-end accountability for every deployment, and collaborate extensively with our partners to ensure a seamless, risk-free engagement.

To help customers and partners accelerate IT transformation, ACADIA leverages the Vblock reference architecture created by Cisco, EMC, and VMware. Vblock infrastructure packages integrate best-of-breed virtualization, networking, compute, storage, security, and management technologies from the three companies for a simplified transition to virtualization and the private cloud.

PRE-INTEGRATED AND TESTED VIRTUALIZED INFRASTRUCTURE

ACADIA services ensure accelerated deployment and optimal operation of the Vblock infrastructure. We pre-configure and integrate a Vblock solution that fits your specific requirements. To ensure simple, streamlined installation and configuration at your site, each Vblock solution is pre-staged and thoroughly tested before shipping.

SCALABLE FOR GROWTH

ACADIA's Vblock solutions provide an easily provisioned and modular approach to scaling unified compute, network and storage capacity as required to support burst capacity requirements, while ensuring quality of service levels for your application environment, to meet variable application and use case workload profiles.

When a customer purchases a product or service from a company, the value of the experience lies in how effectively a business manages the process from beginning to end. Customers are placing increasing emphasis not only on price, but also on their total experience with a business and its products. The current market appears to indicate that:

- Future profits will not be driven by the ability to deliver faster, superior, cheaper products.
- Growing revenue is less about low price, cheap production, and efficient transactions and increasingly more about personalization and customer loyalty.

Because the total customer experience appears to drive customer decisions, it is important that businesses understand why and how to deliver that experience.

COMPREHENSIVE INFRASTRUCTURE ORCHESTRATION

Single, integrated view of the Vblock infrastructure:

- ACADIA's "single pane of glass" management capabilities provide end-to-end visibility—right down to the level of individual virtual machines—and are specifically designed to address the unique requirements of a virtualized operational environment. We provide comprehensive infrastructure orchestration which optimizes your resource consumption and utilization rates.

Self-service provisioning:

- Users will have direct access through a secure, self-service portal to easily provision unified compute, network and storage capacity as required. We've built in the intelligence to govern the appropriate size and balance to meet variable application and use case workload profiles for scale and quality of service requirements.

Anticipates your future infrastructure vision:

- We know your vision must support growth and expansion. We provide open APIs to allow efficient integration with other management platforms and to enable you to federate your private cloud infrastructure to public cloud environments as your business requires.

EMC Corporate Information

EMC Corporation is the world leader in products, services, and solutions for information management and storage. We are a trusted provider of information infrastructure; helping organizations of every size around the world keep their most essential digital information protected, secure, and continuously available.

We are among the 10 most valuable IT product companies in the world. We are driven to perform, to partner, to execute. We go about our jobs with a passion for delivering results that exceed our customers' expectations for quality, service, innovation, and interaction. We pride ourselves on doing what's right and on putting our customers' best interests first. We lead change and change to lead. We are devoted to advancing our people, customers, industry, and community. We say what we mean and do what we say. We are EMC, where information lives.

We help enterprises of all sizes manage their growing volumes of information—from creation to disposal—according to its changing value to the business through information lifecycle management strategies. We combine our best-of-breed platforms, software, and services into high-value, low-risk information infrastructure solutions that help organizations maximize the value of their information assets, improve service levels, lower costs, react quickly to change, achieve compliance with regulations, protect information from loss and unauthorized access, and manage and automate more of their overall infrastructure. These solutions integrate networked storage technologies, storage systems, software, and services.

Information is a business's most important asset. EMC provides the tools that can help you capitalize on it. By bringing our systems, software, services, and solutions together, we can work with you to put a comprehensive information infrastructure to work for your business. We help customers design, build, and manage intelligent, flexible, and secure information infrastructures. These infrastructures are the versatile foundations on which organizations can implement their information lifecycle strategies, secure their critical information assets, leverage their content for competitive advantage, automate their data center operations, reduce power and cooling costs, and much more. With an information infrastructure, people can avoid the potentially serious risks and reduce the significant costs associated with managing information, while fully exploiting its value for business advantage.

WE HELP A RANGE OF CUSTOMERS

EMC works with organizations around the world, in every industry, in the public and private sectors, and of every size, from startups to the Fortune Global 500. Our customers include banks and other financial services firms, manufacturers, healthcare and life sciences organizations, Internet service and telecommunications providers, airlines and transportation companies, educational institutions, and public-sector agencies. Customers benefit from our expertise in key business and IT capabilities.

EMC helps customers meet critical business challenges with a comprehensive set of offerings that include:

- **Systems** – We offer the industry's broadest line of tiered storage platforms and technologies, providing a comprehensive range of performance, scalability, functionality, and connectivity options.

- **Software** – We provide the industry's broadest, most robust line of information infrastructure software for addressing business challenges such as: archiving, backup and recovery, business continuity and availability, collaboration, content management, data mobility and migration, resource management, and virtualization.

- **Services** – We offer the full range of services to design, build, and implement your information infrastructure, including comprehensive consulting services, implementation and integration, onsite operational support, as well as industry-leading training and customer support.

- **Solutions** – We have assembled the right mix of products and services from our own offerings and those of our partners to address a variety of specific situations. Our solutions meet the challenges faced by different industries, functional situations, and different-sized businesses.

STRONG LEADERSHIP RECORD

EMC has a long tradition of innovation and leadership. EMC invested nearly $4 billion in Research & Development and strategic acquisitions that strengthened our core capabilities and extended our reach into new, rapidly growing markets.

This commitment led to IDC's designation of EMC as a market leader in the external storage systems, total storage software, and virtualization software markets. According to the Gartner Magic Quadrants, we lead the industry in enterprise content management, midrange enterprise disk arrays, storage resource management, security and information and event management, Web access management, and storage services. We hold the most stringent quality management certification from the International Organization for Standardization (ISO 9001), and our manufacturing operations hold an MRP II Class A certification.

A GLOBAL PRESENCE

Today, we employ approximately 40,000 people worldwide, more than 40 percent of whom work outside the U.S. We are represented by approximately 400 sales offices and scores of partners in more than 60 countries around the world. We have the world's largest sales and service force focused on information infrastructure, and we work closely with a global network of technology, outsourcing, systems integration, service, and distribution partners.

We are committed to acting in a socially and environmentally responsible manner and to being an attentive and thoughtful neighbor in our local and global communities. We are a publicly traded company, listed on the New York Stock Exchange under the symbol EMC, and are a component of the S&P 500 Index.

WHO WE ARE

Information is your most valuable asset. EMC knows how to make that asset pay dividends—through integrated hardware, software, and services. We've been doing it for some of the greatest companies on the globe for over 30 years, and we can do it for you.

THE EMC BRAND

- **Based on a Promise** – We believe that information is a business's most important asset. Ideas—and the people who come up with them—are the only real differentiator. Our promise is to help you take that differentiator as far as possible. We will deliver on this promise by helping organizations of all sizes manage more information more effectively than ever before. We will provide solutions that meet and exceed your most demanding business and IT challenges. We will bring your information to life.

- **Embodying our Brand** – We are a leading technology company driven to execute, to partner, and to perform. We do our jobs with a passion for delivering results that meet or exceed our customers' and investors' expectations. We pride ourselves on doing what's right over what is easy or expedient. We are devoted to the advancement and well-being of our people, our customers, our industry, and our world. We are EMC—where information lives.

- **The EMC Brand Story** – The human need and capacity to imagine...to discover...to create...and to build relationships is based largely on the use and exchange of information. Yet the world's vast and ever-expanding deposits of information have little power and shed little light if they remain isolated, inaccessible, unprotected, unconnected, or vulnerable to landing in the wrong hands. Information has the power to illuminate our world, but for this to happen, information must be intelligently and efficiently stored, protected, and managed—so that it can be made accessible, searchable, shareable, and ultimately actionable. At EMC, we enable the full realization of the inherent power of information by creating complete information environments that are reliable, efficient, and secure. The result is information that reveals its hidden potential, that's fit and ready to use. With EMC, people and organizations can bring the power of information to life...information that illuminates what's possible and that can move the world forward.

FINANCIAL INFORMATION – INVESTING IN INNOVATION (PRESS RELEASES) 2010
EMC REPORTS FIRST-QUARTER HIGHLIGHTS:

- Record first-quarter consolidated revenue up 23% year over year
- GAAP net income up 92% year over year
- Record first-quarter non-GAAP net income up 70% year over year
- Record quarterly operating cash flow and free cash flow
- Strong year-over-year increase in gross and operating margins

EMC Corporation (NYSE:EMC) today reported record financial results for the first quarter of 2010. Ongoing investments aligned to key customer priorities combined with an industry-leading product and service portfolio helped EMC achieve its second consecutive quarter of record revenue, high double-digit profit growth and all-time record quarterly free cash flow.

First-quarter consolidated revenue was $3.9 billion, an increase of 23% compared with the year-ago quarter. First-quarter GAAP net income attributable to EMC increased 92% year over year to $373 million. First-quarter GAAP diluted earnings per share were $0.17, up 70% year over year. Non-GAAP[1] net income attributable to EMC for the first quarter was $550 million, an increase of 70% compared with the year-ago quarter. First-quarter non-GAAP[1] earnings per diluted share were $0.26, an increase of 63% year over year.

During the first quarter, EMC expanded gross and operating margins substantially on a year-over-year basis, achieved record quarterly operating cash flow of $1.3 billion and record quarterly free cash flow of $1.1 billion. The company completed the first quarter with $10.2 billion in cash and investments.

Joe Tucci, EMC Chairman and Chief Executive Officer, said, "EMC is off to a strong start in 2010, turning in the best first quarter in company history with record first-quarter revenue, high double-digit profit growth and all-time record free cash flow. Our private cloud strategy and focus on four multi-billion dollar markets—each expected to experience rapid growth for many years to come—are resonating very well with customers. We are confident in our ability to lead the next major wave of IT, maintain a long-term double-digit revenue growth rate and continue to take share."

David Goulden, EMC Executive Vice President and Chief Financial Officer, said, "During the first quarter, we saw customers move forward with increased confidence, focusing not only on cost cutting initiatives, but beginning new innovative projects in their traditional and virtual data center infrastructures. This helped us clearly achieve the 'triple play' we projected last quarter by gaining market share while investing for the future and increasing profitability. Looking ahead, we remain confident that we'll continue to execute on all three of these areas."

FIRST-QUARTER HIGHLIGHTS

EMC's Information Infrastructure business for the first quarter—comprising product and service revenue from the company's Information Storage, RSA Security, and Content Management and Archiving business segments—reached $3.3 billion, increasing 22% year over year. First-quarter highlights included strong customer demand and double-digit revenue growth for EMC's market-leading high-end Symmetrix storage product portfolio, which increased first-quarter revenue by

28% compared with the year-ago quarter, and EMC's mid-tier platform product portfolio², which grew revenue 32% year over year. Within EMC's Backup and Recovery Systems Division (BRS), EMC Data Domain and Avamar next-generation backup and recovery products each grew over 100% on a year-over-year basis³. Additional highlights included strong customer demand for EMC's RSA information security solutions and the company's broad portfolio of consulting and professional services.

VMware (NYSE: VMW), which is majority-owned by EMC, contributed first-quarter revenue of $632 million, increasing 34% compared with the year-ago quarter.

EMC consolidated first-quarter revenue from the United States reached $2.1 billion, an increase of 29% year over year, representing 54% of consolidated first-quarter revenue. Revenue from EMC's business operations outside of the United States reached $1.8 billion, an increase of 17% year over year, representing 46% of consolidated first-quarter revenue. Within this, revenue increased 16%, 11% and 28% year over year respectively in EMC's Europe, Middle East and Africa (EMEA), Asia Pacific and Japan (APJ) and Latin America regions.

BUSINESS OUTLOOK

The following statements are based on current expectations. These statements are forward-looking, and actual results may differ materially. These statements do not give effect to the potential impact of mergers, acquisitions, divestitures or business combinations that may be announced or closed after the date hereof. These statements supersede all prior statements regarding 2010 financial results set forth in prior EMC news releases.

All dollar amounts and percentages set forth below should be considered to be approximations.

The following statements regarding 2010 financial results have been revised from the statements disclosed by EMC on January 26, 2010:

- Consolidated EMC revenues are expected to be $16.5 billion for 2010.
- Consolidated GAAP diluted earnings per share are expected to be $0.84 for 2010.
- Consolidated non-GAAP diluted earnings per share, excluding the impact of restructuring and acquisition-related charges, stock-based compensation expense and intangible asset amortization, are expected to be $1.18 for 2010.
- GAAP operating income is expected to be 14% to 15% of revenues for 2010, and non-GAAP operating income is expected to be 20% to 21% of revenues for 2010. Excluded from non-GAAP operating income are restructuring and acquisition-related charges, stock-based compensation expense and intangible asset amortization, which account for less than 1%, 4% and 2% of revenues, respectively.
- The weighted average outstanding diluted shares are expected to be 2.15 billion for 2010.

The following statements regarding 2010 financial results remain unchanged from the statements disclosed by EMC on January 26, 2010:

- 2010 GAAP research and development ("R&D") expense and non-GAAP R&D expense are each expected to increase 20% over 2009. Excluded from the increase in non-GAAP R&D expense is stock-based compensation expense of $42 million and intangible asset amortization of $8 million.

- Transition costs to a more efficient cost structure are expected to be $50 million in 2010.
- Total non-operating expense, which includes investment income, interest expense and other expense, is expected to be $90 million in 2010.
- Consolidated restructuring and acquisition-related charges, stock-based compensation expense and intangible asset amortization are expected to be $0.02, $0.24 and $0.08 per diluted share, respectively, for 2010.
- The consolidated GAAP income tax rate is expected to be 17% for 2010. Excluding the impact of restructuring and acquisition-related charges, stock-based compensation expense and intangible asset amortization, which collectively impact the tax rate by 3%, the consolidated non-GAAP income tax rate is expected to be 20% for 2010. Both GAAP and non-GAAP income tax rates assume that the U.S. research and development tax credit will be re-enacted in 2010.
- EMC expects to repurchase up to $1.0 billion of the company's common stock.

Cisco Corporate Information

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Cisco Systems, Inc.

Corporate Headquarters

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For Cisco executive organization and biographies, please visit:
http://newsroom.cisco.com/dlls/tln/exec_team/bios.html.

CISCO OVERVIEW

Cisco is an independently-owned, publicly-traded large business with average annual revenue for the past 3 years of approximately $29.4 billion. Cisco is a joint venture partner with Microsoft, HP, IBM, and other companies. As of the end of Q1 FY2010 (ending October 24, 2009), Cisco had 63,756 employees worldwide.

Cisco hardware, software, and service offerings are used to create the Internet solutions that make networks possible — providing easy access to information anywhere, at any time. Cisco was founded in 1984 by a small group of computer scientists from Stanford University. Since the company's inception, Cisco engineers have been leaders in the development of IP-based networking technologies. This Cisco tradition of innovation continues with industry-leading products and solutions in core development areas of routing and switching, as well as in advanced technologies such as Application Networking, Data Center, Digital Media, Physical Security, Mobility, Security, Storage Networking, TelePresence, Unified Communications, Video, and Virtualization.

CISCO RESEARCH AND DEVELOPMENT

Cisco is committed to an active program of Research and Development (R&D). Our R&D expenses in FY09 were $5.2 billion. R&D expenses represent 14 percent of net sales, reflecting ongoing efforts in a wide variety of areas such as data, voice, and video integration; cable modem technology; wireless access; dial access; enterprise switching; optical transport; security; network management; and high-end routing technologies. We expect that R&D expenses will continue to increase in absolute dollars as we continue to invest in technology to address potential market opportunities.

Cisco develops most of its products internally, using a deep pool of global engineering talent. With one of the largest research and development budgets of any technology firm, Cisco invests heavily to enable its 20,000+ engineers to develop not only new products, but new technologies as well.

To protect our internally developed and acquired technologies, Cisco actively pursues patents. To safeguard our intellectual property and drive innovation, Cisco holds more than 2,500 issued U.S. patents, with active applications for more than 4,000 others.

CISCO TECHNOLOGY STRATEGY

When a customer purchases a product or service from a company, the value of the experience lies in how effectively a business manages the process from beginning to end. Customers are placing increasing emphasis not only on price, but also on their total experience with a business and its products. The current market appears to indicate that:

- Future profits will not be driven by the ability to deliver faster, superior, cheaper products.
- Growing revenue is less about low price, cheap production, and efficient transactions and increasingly more about personalization and customer loyalty.
- Because the total customer experience appears to drive customer decisions, it is important that businesses understand why and how to deliver that experience.

Cisco has always been guided by our customers in developing our technology strategy, which is closely tied to market transitions. For example, when our customers recommended we offer switching solutions, we acquired Crescendo to accommodate this need. When an insurance company in Texas requested we enter the high-end consulting business, we created the Internet Business and Solutions Group (IBSG). And as a final example, when customers requested more involvement in services, Cisco created our Advanced and Advisory Services.

As we have moved from product leadership to segment leadership and now to leadership in network architecture, the total market available to Cisco has grown. Leadership in these areas enables us to develop much deeper relationships with our customers through more frequent collaboration with them. The importance of customer relationships drives the Cisco vision of becoming the world's leading IT and communications company.

INTELLIGENT INFORMATION NETWORK

Cisco defines strategy as "a series of actions taken to accomplish a goal." Based on that definition, we express our strategy in the form of 3- to 5-year goals and publish annual initiatives to hold ourselves accountable to measurable results in pursuit of these goals.

The most fundamental of these goals is our Intelligent Information Network (IIN) vision.

The core idea of this vision is simple. The more intelligent the network, the greater the opportunity to reduce complexity. Reduced complexity elevates the ability of the network to achieve organizational and business goals, while helping to lower total cost of ownership and increase investment protection.

The IIN architectural approach emphasizes integration across and between the large number of networks that connect enterprises, service providers, small- and medium-sized businesses, and consumers. The Cisco leadership position in these individual markets helps us view the entire network as greater than the sum of its parts. This approach extends beyond network technology to include an architectural perspective designed to maximize IT's overall value to business.

The Cisco IIN vision (Figure X) reflects how Cisco believes network architectures will evolve over the next 3 to 5 years, moving toward a holistic system designed to transcend connectivity and capitalize on services that exploit the cost-effective nature and scalability of IP networks. The Cisco IIN is intended to guide individual customers to this systems approach to networking.

Figure 2.   Cisco IIN Vision

Cisco's 3-5 Year Technology Vision:
The Intelligent Information Network
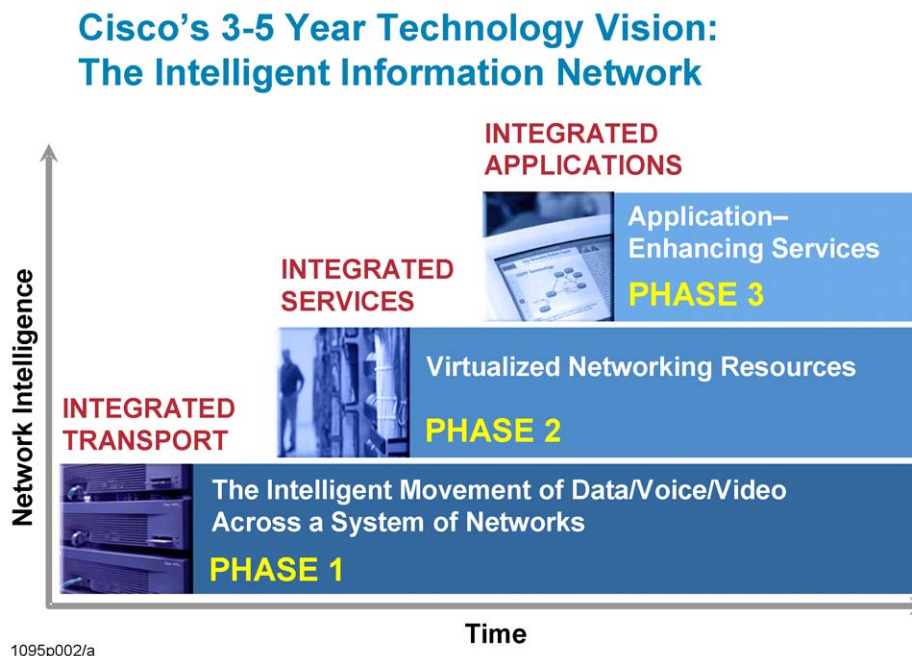
The Cisco IIN roadmap contains three phases. Each phase is a fundamental building block to enable the right architectural combinations that will accommodate the virtually infinite number of network implementations that our customers use. Each phase, while executing in the present, also addresses future needs, ever increasing the relevancy of the network to our customers.

The three-phases are:

- Phase 1 Integrated Transport: Consolidate data, voice, and video onto an IP network.
- Phase 2 Integrated Services: Incorporate elements of applications and the OS into the IP network, allowing scalability and performance improvement. Unify common elements to simplify use and management.
- Phase 3 Integrated Applications: Take full advantage of the convergence of applications on IP to create new applications and uses for applications that were not possible before. Simplify access to, and use of, applications.

CISCO TECHNICAL ASSISTANCE CENTER

The Cisco Technical Assistance Center (TAC) puts you directly in touch with field engineers to rapidly solve network issues and help you mitigate future problems. Cisco TACs around the globe use a follow-the-sun schedule so you can receive support whenever you need it. You have access to the TAC through your Cisco SMARTnet Service contract. Cisco TAC offers the State of Washington the following advantages:

- Resolve issues fast to maintain network performance
- Direct access to Cisco technical experts
- Highly-trained network and application software engineers worldwide
- Computer science/electrical engineering degrees

- Engineers average 5 years of industry experience
- 450+ CCIE professionals
- Expertise in a broad array of technologies
- 24x7 global access by phone, Web, or email.

VMware Company Overview

VMware (NYSE: VMW) is the global leader in virtualization solutions from the desktop to the data center. VMware delivers solutions for business infrastructure virtualization that enable IT organizations to energize businesses of all sizes. With the industry leading virtualization platform -- VMware vSphere ™ -- customers rely on VMware to reduce capital and operating expenses, improve agility, ensure business continuity, strengthen security and go green.

With 2009 revenues of $2 billion, more than 170,000 customers and 25,000 partners, VMware is the leader in virtualization which consistently ranks as a top priority among CIOs. VMware is headquartered in Silicon Valley with offices throughout the world and can be found online at www.VMware.com.

VMware was founded in 1998 to bring mainframe-class VM technology to industry-standard computers. VMware delivered its first product, VMware Workstation, in 1999 and entered the server market in 2001 with VMware ESX Server. Today the company has two main product lines: data center products and desktop products. Our data center products include VMware Infrastructure, vSphere and vCenter Management Services. VMware Infrastructure/vSphere is comprised of ESX Server, which is the base operating system, and vCenter Management Server, which is the management console. Desktop products include VMware View, which is our enterprise desktop suite designed to work with Thin Clients and traditional PCs, and VMware Workstation, which is used to test and create multiple VMs on one desktop or laptop. Headquartered in Palo Alto, California, VMware is majority-owned by EMC Corporation (NYSE: EMC).

VMWARE PROFESSIONAL SERVICES ORGANIZATION

VMware's experienced Professional Services Organization will fulfill the technical services outlined in this response. This experienced team of VMware Certified Professional (VCP) consultants is uniquely qualified to offer PPDIOO services for its virtualized computing environment. VMware Professional Services is the industry's largest professional services organization, focused solely on virtual infrastructure solutions. VMware Professional Services consultants not only have deep expertise in the VMware product set, but they have extensive experience in addressing the installation and management requirements for all types of servers, operating systems, networking elements, storage systems, and management platforms effectively. They have completed hundreds of complex implementations to date for both the government and commercial sectors using proven, best practices.

In addition to over 5 years of experience in assessment, design, and implementation of virtual infrastructure solutions, VMware Professional Services has focused a lot of attention on developing a consistent delivery approach. VMware Professional Services has developed Virtual Infrastructure Methodology, which is an integrated, end-to-end engagement and project delivery methodology. It provides consistent, predictable, and scalable management and delivery of virtual infrastructure solutions. Each member of the VMware Professional Services organization has been trained to work within this proven framework, which has been used in hundreds of projects that VMware has successfully delivered on time and within budget. It has proven to be a consistent method for meeting customers' expectations.

Projects with similar concept

In particular, please describe any projects you have been involved in that are similar in concept to what is described in this RFI, including design, management and operations approach, training provided, security assurance, relevant lessons learned, timeline to go from concept to production, and financial capacity.

EMC Response: Please find below a list of case studies that describe similar projects.

BUILDING A SAFER, SMARTER STATE GOVERNMENT - STATE OF OREGON SAFEGUARDS CONFIDENTIAL INFORMATION WITH CISCO SELF-DEFENDING NETWORK SOLUTION

Business Challenge

The state of Oregon is committed to improving the quality of life for all of its citizens. A national model for improving government, the state strives to deliver the highest level of service to its residents. More than 100 agencies are responsible for day-to-day government concerns such as education, public safety, human services, transportation, business, finances, and the environment.

Information technology plays a key role in helping all of these agencies work efficiently, collaborate, and respond to constituents. Traditionally, each organization has been responsible for maintaining its own IT environment. Different systems and staff were dispersed across the state, each using its own business approach. However, this model left the state of Oregon vulnerable to network security issues that could bring government operations to a standstill.

"Some of our agencies had very good security organizations and response, but others were not quite as prepared," says Al Grapoli, network manager at the state of Oregon. "Any security breach had the potential to spread everywhere, and was difficult for us to identify and isolate."

To consolidate its dispersed networks and make operations more efficient and manageable, the state launched a new initiative: The Computing and Networking Infrastructure Consolidation (CNIC) project. Security was a top priority for the project, because the state had to meet strict standards to protect private information.

"Our agencies are subject to several different federal and state regulations, such as the Health Insurance Portability and Accountability Act (HIPAA), which governs personal health information," says Grapoli. "These regulations require us to safeguard information at all of our organizations, from Health and Human Services to the Department of Motor Vehicles, state police, and many other agencies."

The state of Oregon needed a complete security solution that could provide defense in-depth at all of its office networks. To keep key government services running, the state also sought to make its network infrastructure more resilient and reliable. Since IT staff size was limited, the solution would have to be easy to manage and maintain.

Network Solution

In 2005, the State of Oregon began work on the CNIC initiative, which was based on a new converged data center featuring a Cisco® network. The Cisco Self-Defending Network was a critical component of the CNIC project in that the new data center clearly needed to protect highly confidential information, comply with government regulations, and be flexible to meet the diverse needs of all of its agencies.

"To achieve a comprehensive approach to security, we looked at a variety of products and architectures. The Cisco solution delivered the highest level of flexibility, and enabled us to build multiple layers of security. It really fit into what we needed to do, because each agency required a specific level of security for its operations," says Grapoli.

As a first step in implementing its new security architecture, Grapoli and his team converted its existing repertoire of Cisco PIX Firewalls to Cisco ASA 5500 Series Adaptive Security Appliances at more than 60 remote offices. More robust and flexible than the Cisco PIX Firewall, the Cisco ASA 5500 Series Adaptive Security Appliances are purpose-built security solutions that can easily scale to meet the state of Oregon's changing needs. A core component of the Cisco Self-Defending Network, the Cisco ASA 5500 Series provides proactive threat defense that stops attacks before they spread through the network, controls network activity and application traffic, and delivers both IPsec and Secure Socket Layer (SSL) VPN connectivity.

"Migrating from Cisco PIX to the Cisco ASA has been straightforward, because we are using the same operating system, yet gaining greater flexibility," says Grapoli. "We haven't had any significant issues migrating; we simply take the rule set from the Cisco PIX and plug it into the Cisco ASA."

The state looks forward to exploring the many unique capabilities of the Cisco ASA 5500 Series, and is already taking advantage of the advanced firewall and VPN capabilities. These robust security features protect the network against unauthorized access and provide secure connectivity for agency employees.

"With the Cisco ASA, agency employees working at remote sites can securely access a wide variety of tools and applications. For example, they can make changes to their employee benefits plan over a secure Web site," says Grapoli.

For end-to-end network protection, the state is deploying a Cisco Intrusion Prevention System (IPS) solution. Using Cisco IPS 4200 Series Sensors, the state can identify, classify, and stop known and unknown threats like worms, network viruses, and application threats.

"Intrusion detection can only go so far in stopping threats, but Cisco's sophisticated intrusion prevention capabilities let us work proactively to discover and eliminate threats early," says Grapoli. "IPS can stop attacks and intrusions before they can cause any damage on our network."

To make the most of its security investment, the state needed a way to monitor all of the network's security devices and host applications to develop an end-to-end view of the network. Using the Cisco Security Monitoring, Analysis and Response System (CS-MARS), Grapoli and his team can use the intelligence in their network to identify, manage, and counter security threats.

Cisco Security Services also played an important role at every stage of the network solution deployment. The state of Oregon subscribes to the Cisco Security Optimization Service which affords Grapoli and his team skilled Cisco engineers to assist with designing, implementing, operating, and optimizing the security architecture.

"Cisco services have provided a tremendous value," says Grapoli. "We would not have been able to meet our objectives without them."

Business Results

The new Oregon data center and network have quickly had a dramatic impact on security and management, improving network visibility and reducing threat response time.

"Under our past model, each agency was managing its own network resources," says Grapoli. "Our Cisco solution enables us to centralize network administration, so we can exercise better control across many agencies—even with our small staff."

The Cisco solution has also enabled the State of Oregon to standardize its equipment and procedures to manage the network more efficiently and make the best use of employee expertise. "Using a standardized platform lets us avoid the need to support firewalls and other devices from multiple vendors," says Grapoli. "Trying to manage five different firewalls is difficult."

CS MARS has played a key role in helping the state safeguard its organization, transforming raw network and security data into intelligence that can be used to fight threats. "CS MARS is a big help in enabling us to capture logging, and review and rapidly respond to threats," says Grapoli. "Just this past week it helped us discover a new virus. We picked it up quickly and alerted all the organizations that had been impacted by it."

Cisco Security Services engineers have been actively involved in building the new state of Oregon network. Designed to support every stage of the solution lifecycle, Cisco Services help the State of Oregon to continually assess how well its technology aligns with its business needs.

"Working with Cisco Services, we have initiated a six-month analysis of our WAN and LAN," says Grapoli. "We will evaluate all of the network devices in use, and determine how they impact the overall health and security of the network."

With a comprehensive Cisco Self-Defending Network in place, Grapoli is confident that the state of Oregon can comply with government requirements today, and tackle new security issues that emerge in the future.

"When we build a security environment that is flexible, manageable, and layered, we can handle any new challenges that may appear," he says. "Our Cisco solution definitely gives us this capability."

County Builds Centralized Data Center

King County used Nexus platform and MDS switch to build a highly efficient data center shared by all departments.

EXECUTIVE SUMMARY
King County, Washington
• Government
• 1.9 Million Residents
Business Impact
• Helped to ensure continuity of government
• Increased equipment utilization
• Simplified network management
• Increased government agility

Challenge

Located on Puget Sound in Washington State, King County is home to more than 1.9 million people, making it the 14th most populous county in the United States. When the county's data center lease expired, the county Office of Information Resource Management (OIRM) decided to build a highly efficient, scalable, and green data center. "Organizations typically redesign the data center only once every 15 years, so we seized the opportunity to design an architecture that would conserve taxpayer dollars while increasing government service effectiveness," says Gary Lemenager, IT enterprise business solutions director, King County.

Requirements for the new data center network architecture included high availability, 10 Gigabit Ethernet to support server virtualization, ease of management to minimize operational costs, and high port density to minimize equipment costs, power, and cooling.

Solution and Results

King County OIRM built the new data center network using the Cisco Nexus® platform and Cisco® MDS 9222i Switches. Approximately 476 servers, more than half of the county's total, have been moved to the new data center.

OIRM designed the data center to minimize space requirements while increasing availability. Each data center pod contains 12 server racks that connect over Gigabit Ethernet to another rack containing Cisco Nexus 2148 Fabric Extenders. These fabric extenders aggregate into two Cisco Nexus 5020 Switches in the same rack, which connect over 10 Gigabit Ethernet to a pair of Cisco Nexus 7010 Switches. The county also continues to use its older 100-MB servers, connecting them to the Cisco Nexus 7010 Switches by way of Cisco Catalyst® 3750E Switches.

To access a shared storage area network (SAN), standalone servers connect to a pair of Cisco MDS 9222i Switches, and blade enclosures connect through an internal Cisco MDS 9124e Fabric Switch or third-party switch. Operating the blade server switches in N-Port Virtualization (NPV) mode avoids interoperability issues and simplifies SAN management.

Cisco Advanced Services tested Cisco switches in the county's environment in the Cisco Customer Proof of Concept (CPOC) Lab, and also provided optimization services after the switches were implemented. The main benefits of the Cisco Data Center 3.0 solutions for King County include:

- **Continuity of government:** Factors contributing to high network availability include:
  - **Equipment consolidation:** "Cisco Data Center 3.0 solutions contribute to a smaller data center footprint, making it easier to diagnose and remediate network issues and help ensure continuity of government services," says Roger Kirouac, interim county chief information officer.
  - **Redundancy:** Cisco Advanced Services advised the IT team on using the virtual PortChannel (vPC) feature of the NX-OS software to make each pair of Cisco Nexus 5020 and 7010 Switches look like a single logical switch to attached devices. If one switch fails, the other takes over without any noticeable interruption to the service.
  - **Nondisruptive software upgrades:** Using the Cisco Nexus switch In-Service Software Upgrade (ISSU) capability, OIRM can upgrade switch software without interrupting access to critical applications for public safety, law, justice, and more. "The ability to upgrade Cisco Nexus switches without taking them down supports public safety, citizen service, and government workforce productivity," says Jim Keller, IT governance director, King County.
- **Economies of scale:** Departments that house their services in the new data center share ports on the Cisco Nexus switches and Cisco MDS 9222i Switches instead of purchasing their own equipment, reducing government costs. To isolate each department's traffic and management, the IT team can easily create virtual SANs (VSANs).
- **Support for new, cost-saving technologies:** The Cisco Nexus 5020 switch provides the 10 Gigabit Ethernet connectivity needed for server virtualization, which has helped avoid server sprawl and associated power and cooling costs. The 10 Gigabit Ethernet connectivity will also enable the county to adopt Fibre Channel over Ethernet (FCoE), saving the cost of separate adapters, cables, and switch ports for data and storage traffic.
- **Reduced power consumption:** OIRM designed the data center to minimize environmental impact. The high port density of the Cisco Nexus switches contributes to the county's green initiative by minimizing the number of devices to power and cool.
- **Simplified management:** The IT team saves time by managing all Cisco Nexus 2048 Fabric Extenders as part of the Cisco Nexus 5020 Switch. Provisioning is faster as well, because the IT team can very quickly create VSANs on the Cisco MDS 9222i Switch for individual departments and applications instead of provisioning physical SANs. In the future, OIRM plans to further simplify management by using Cisco Data Center Network Management (DCNM) Software to manage all Cisco Nexus switches and the Cisco MDS switches from a single interface.

Lori Dickneite, supervisor of engineering design for King County, summarizes the benefits: "Cisco Nexus and MDS switches helped us create a clean network architecture that simplifies troubleshooting and gives us the ability to respond quickly to each department's changing business needs."

> "Cisco Data Center 3.0 solutions contribute to a smaller data center footprint, making it easier to diagnose and remediate network issues and help ensure continuity of government services."
> **—Roger Kirouac, Interim Chief Information Officer, King County, Washington**

For more information about Cisco Data Center 3.0 solutions, visit: http://www.cisco.com/go/dc

For more information about Cisco Nexus switches, visit: http://www.cisco.com/go/nexus

For more information about Cisco MDS Multilayer Switches, visit: http://www.cisco.com/go/mds

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Ohio Department of Commerce

Ohio | **Department of Commerce**

"Leveraging technology to virtualize 85 percent of our IT environment gives us the operational efficiency that we absolutely need in today's tight budget conditions."

- Alan Shellhause
  Chief Information Officer,
  Ohio Department of Commerce

KEY HIGHLIGHTS

Challenge
Physical IT infrastructure is difficult to scale as additional services need to be deployed.

Solution
VMware technology offers a way for organizations to create an almost entirely virtual IT infrastructure that reduces costs and simplifies administration

VMWare at Work
VMware Infrastructure 3 Enterprise, featuring:
- ESX Server 3 with VMFS
- VirtualCenter 2
- VMotion
- Distributed Resource Scheduler (DRS)
- High Availability (HA)

Deployment environment
- Hardware: Dell 2950 servers & 1955 PowerEdge Blade Servers, PowerEdge M600 Blade servers with iSCSI Equalogic PS300e & PS400e Storage Arrays with over 50+ TB storage
- Guest operating systems: Windows 2003
- Virtualized production applications: SQL, Microsoft Exchange, IIS, file servers, print servers, 63 different proprietary applications related to business of the Ohio Department of Commerce with many being N-tier web services and/or customized COTS applications.

The Ohio Department of Commerce is one of the state's chief regulatory agencies. The department has nine different divisions that focus on areas such as financial institutions, liquor control, labor and worker safety, real estate & professional licensing, industrial compliance, securities, state fire marshal, and unclaimed funds.

"We're kind of a conglomerate agency with many different missions," explains Alan Shellhause, chief information officer for the department. "On the IT side, our job is to deliver the applications that support those missions. As we started getting more requests for additional services, that put pressure on us to deploy more and more physical servers."

VMware Infrastructure 3 offered a way for the department to control that growth while making its operations more efficient.* Within its two main data centers, which house more than 100 servers, the department began to virtualize critical systems—everything from tier 1 helpdesk support to major application deployments—shrinking the number of physical servers required.

"At this point, our infrastructure is probably 85 percent virtualized, and on the Wintel side of things, we're going to get as close to 100 percent virtualized as we can," says Shellhause. "We've also started looking at ways to expand our virtualized environment. We are open to whatever will fit our environment and give us a return on investment."

*Disclaimer: Comments presented in this article are solely those of the persons quoted. They do not necessarily represent the opinions of the Ohio Department of Commerce or its Director, and the comments herein should not be interpreted as an endorsement of the product or its provider. All potential users of this product are encouraged to conduct their own independent research, as needs and results may vary from user to user.

Results

- **Reduce energy consumption 55-60 percent.** "Our data centers reduced their energy consumption significantly once we virtualized, which helps us stay in line with the State of Ohio's goals for going green," says Shellhause.

- **Reduce cooling by 35 percent.** "We had air conditioning units that were running at close to 100 percent capacity that are now running at 65 percent," says Shellhause.

- **Reduce total operational costs by 5 percent.** "The cost reduction in operations after deploying virtual technology is definitely there," says Shellhouse. "It's provable and it's measurable."

- **Do more with less.** "With state budgets the way they are, we are not able to get additional staff to manage additional deployments," says Shellhause. "You have to find ways to manage the data center with the same number or a smaller number of people. That's another benefit that we've seen from virtualizing our environment."

vmware®

vmware®

"For us, VMware Infrastructure 3 has been a lifesaver—it allows us to test and develop new applications quickly and affordably. I can't think of a single organization—big or small—where VMware technology wouldn't be able to improve IT efficiencies across the board."

Robert Lazo
Director, Systems & Operations, Los Angeles Universal Preschool

KEY HIGHLIGHTS

INDUSTRY: **EDUCATION**

LAUP
LOS ANGELES
UNIVERSAL PRESCHOOL

CHALLENGE

Find a cost-effective way to test and develop new software applications

SOLUTION

VMware technology enables rapid deployment of a test and development environment without the higher costs associated with physical machines.

VMWARE AT WORK

VMware Infrastructure 3 Enterprise, featuring:

• ESX Server 3 with VMFS

• VirtualCenter 2

• VMotion

• Distributed Resource Scheduler (DRS)

• High Availability (HA)

DEPLOYMENT ENVIRONMENT

• HP Proliant DL385s attached to an ECM CX3-20 SAN

• Guest operating systems: Windows Server 2003 (Enterprise and Standard), Windows XP

• Applications: Microsoft CRM, Blackberry, Outlook Web Access, Print & File servers, SQL

Los Angeles Universal Preschool

Los Angeles Universal Preschool (LAUP) is a non-profit whose goal is to make voluntary, high-quality preschool available to every four-year-old child in Los Angeles County, regardless of family income.

At LAUP, every IT action and effort helps staff reach LAUP's primary goal: helping get children into a quality preschool. One of the IT initiatives involved rolling out a new CRM system and a custom-built proprietary application. Naturally, extensive testing and development was required on these new applications before they could be moved into production; the question was how to do it cost effectively. "The cost of creating a physical testing and development environment by purchasing hardware was too high—some of the price quotes were just astronomical," says Robert Lazo, director of systems and operations at LAUP.

VMware Infrastructure 3 provided the solution that LAUP was seeking. Rather than purchasing numerous expensive servers for testing and development purposes, LAUP was able to effortlessly create virtual machines using VMware technology. "We initially rolled out three ESX Servers for our test and development environment, and once we saw how successful it was, we added a fourth ESX Server for some of our production applications," says Lazo. "Moving forward, my goal is to get as close to 100 percent virtualization as we can."

Results

• **Avoid $100,000 in hardware costs.** "The cost of purchasing physical servers would have easily run over $100,000," says Lazo. "Using VMware technology allowed us to avoid that expense."

• **Save hundreds of staff hours.** "The fact that we're able to provision a new server in less than five minutes has literally saved us hundreds of staff hours over the past year," says Lazo. "Without VMware technology, we'd need to spend hours every time we wanted to build a server."

• **Maximize hardware utilization.** "Right now, we have 15 to 20 virtual machines running on each of our ESX Servers," says Lazo. "That lets us really put our hardware to work and get the most mileage out of our IT purchases."

EMC STORAGE MANAGED SERVICES CUSTOMER STORIES:

EMC Storage Managed Services (SMS) provides comprehensive onsite management of storage operations based on defined service agreements (SLA's). This can include EMC or non-EMC products. Using EMC management and ITIL best practices and proven operations processes, a dedicated EMC team of storage management professionals assumes full onsite responsibility for all or part of your storage environment over a fixed term. If you choose to resume storage management operations at the end of a contract term, EMC endures a seamless transfer of all storage responsibilities back to you, including the EMC "run-book" which documents the ITIL-based processes and best practices implemented in the customer's organization. Typical billing is on a $ per managed GB per month. This pricing model gives you the ability to scale up or scale down as needed and is staffed on your premise and/or remotely. You benefit from predictable storage-management quality and cost.

- EMC Storage Managed Services has grown to over 30 customers, 52 data centers and more than 15 Petabytes of managed storage

Section 7 – Additional Materials and Other Items

Please provide any other materials, suggestions, and discussions you deem appropriate.

Acadia Response:

CISCO PREPARE SERVICES

Cisco can help assess the State of Washington data center's ability to support critical business goals such as ensuring business continuance, managing operational risks, improving operational efficiency, and delivering competitive advantage. The assessment can be followed by tailored services to help you plan, design, and implement a solution to address gaps and act on recommendations.

CISCO PLAN AND DESIGN SERVICES

Cisco engineers collaborate with you to develop detailed design standards for your data center and to evaluate the ability of your applications to meet your future requirements. These services provide recurring analyses of the performance data and configurations from your network devices to give you a continuous, strategic view of your data center network environment. Ongoing communication with Cisco experts helps keep you informed regarding new products and software features for your environment.

Examples of Cisco PPDIOO services include:

- Cisco Data Center Assessment Services (Architecture, Operations, Facilities, SAN, Application Networking, Business Continuance, and Branch Consolidation)
- Cisco Planning and Design Services (SAN, Wide Area Application Services, ACE, and Nexus)
- Cisco Application Profiling Service
- Cisco Data Center Consolidation Service
- Cisco VFrame/Virtualization/VMware Data Center Service.

CISCO OPERATE SERVICES

Cisco SMARTnet Service includes around-the-clock global access to the Cisco Technical Assistance Center (TAC) and access to the extensive Cisco.com knowledge base and tools. Other Operate services include:

- Next-business-day advance hardware replacements (premium options available for critical devices, such as 2-hour replacement and onsite parts replacement and installation)
- Operating system software updates and upgrades
- Proactive diagnostics and real-time alerts with Smart Call Home on the Cisco Nexus series
- Cisco Catalyst 6500 switches.

CISCO OPTIMIZATION SERVICES

Cisco Data Center Optimization Services help our customers achieve operational excellence by providing informal training that prepares your staff to manage data center technologies knowledgeably.

Examples of Cisco optimization services include:

- **Application and Content Networking System (ACNS):** Experience a consistently high level of application performance across your WAN.
- **ACE**: Help ensure your users have fast, secure application access in a scalable environment.
- **NEXUS**: Maintain a high level of data center performance and operational efficiency while evolving to a next-generation data center.
- **OPTICAL**: Deliver a high level of optical performance, availability, and support across the network.
- **SAN**: Deliver a consistently high level of SAN performance and availability and support growing information management needs.
- **WAAS**: Improve application responsiveness across your WAN.
- **VMware**: Plan for smooth deployment of an end-to-end virtualization solution with a single set of recommendations jointly developed by VMware and Cisco.

The Cisco Data Center Optimization Services offer a variety of options, allowing you to select the combination of services and technology support you need. Each service includes an annual assessment, network support, and continuous learning service. You can further customize these optimization services by choosing the activities and deliverables you need. (Depending on the type of technology, some deliverables may vary.)

You can also choose optimization services to help you improve the performance of other Cisco technologies, such as unified communications, wireless LAN, and core routing and switching. These services help you to improve your network continuously and increase your ROI.

EMC

EMC Global Services (EGS) leverages the talents of its 13,000+ people to provide consulting, solution, management, implementation, integration, support, and education services. Our services help our customers attain their business objectives by maximizing the value of their information strategy and information infrastructure with EMC's products and technologies. EGS is organized as follows:

- **Consulting Services**: Our Consulting Services are primarily focused on the PPDIOO lifecycle phases. These services help our customers maximize the value of their IT investments by addressing key challenges and preparing the customer's solutions to leverage emerging technologies. Our consulting services cover many areas, but examples of the types most relevant to the State of Washington NSC program include data center consolidation, energy efficiency, information security, virtualization, COOP, backup and recovery, and application-specific services (e.g., Oracle, SAP, Exchange). Our consulting services include activities such as requirement gathering, requirement analysis, state assessments, gap analysis, recommendations for improvement, TCO and ROI reports, solution design, and planning analysis and documentation.
- **Technology Implementation and Integration Services**: Our Technology Implementation and Integration Services are primarily focused on the Design and Implement lifecycle phases. These services provide product-related and value-added

services from basic installation to complex, custom implementation and integration, including best practices and knowledge management.

- **Managed Services and Customer Support Services**: Our Managed Services and Support Services are primarily focused on the Operate lifecycle phase. Our Managed Services can provide the necessary management resources and expertise needed, onsite, for both short- and long-term projects. EMC can provide day-to-day operational support, specific operational advice and improvements, and comprehensive management of our customers' solutions. Our Customer Support Services provide maintenance and support services and consists of our global support centers, remote support technology, eServices, best practices, and experienced field engineers. They all contribute to delivering the service necessary to stay up and running 24/7.

- **Education and Training Services**: Our Education and Training Services include training, accreditation, and certification programs for EMC employees, customers, partners, and the broader IT industry.

- **Classification and Policy**: Infrastructure Consulting Services are key components of EMC Consulting that help customers improve their IT operations, infrastructure, and policies through a consultative approach and unique service offerings. With far-reaching expertise in infrastructure technologies and IT operational best practices, EMC Infrastructure Consulting can help the State of Washingtonimprove data governance, optimize security, and reduce infrastructure costs and complexity.

VMWARE

VMware Professional Services Organization - VMware's experienced Professional Services Organization will fulfill the technical services outlined in this response. This experienced team of VMware Certified Professional (VCP) consultants is uniquely qualified to offer PPDIOO services for its virtualized computing environment. VMware Professional Services is the industry's largest professional services organization, focused solely on virtual infrastructure solutions. VMware Professional Services consultants not only have deep expertise in the VMware product set, but they have extensive experience in addressing the installation and management requirements for all types of servers, operating systems, networking elements, storage systems, and management platforms effectively. They have completed hundreds of complex implementations to date for both the government and commercial sectors using proven, best practices.

In addition to over 5 years of experience in assessment, design, and implementation of virtual infrastructure solutions, VMware Professional Services has focused a lot of attention on developing a consistent delivery approach. VMware Professional Services has developed Virtual Infrastructure Methodology, which is an integrated, end-to-end engagement and project delivery methodology. It provides consistent, predictable, and scalable management and delivery of virtual infrastructure solutions. Each member of the VMware Professional Services organization has been trained to work within this proven framework, which has been used in hundreds of projects that VMware has successfully delivered on time and within budget. It has proven to be a consistent method for meeting customers' expectations.

UNIFIED COMPUTING SYSTEM REMOTE MANAGEMENT SERVICE

The Unified Computing Remote Management Service (RMS) provides comprehensive monitoring and management of your Unified Computing System, 24 hours a day, 365 days a year. Delivered by an experienced team of engineers using industry leading tools and IT Infrastructure Library (ITIL®)-based processes, we proactively monitor your unified computing environment, including devices, applications, and supporting network infrastructure for fault and performance events. From our Global Network Operations Center (NOC), we resolve incidents and take the lead in co-managing the network as an extension of your IT team. Unified Computing Remote Management Service is composed of flexible standard and elective elements that may be combined to deliver a tailored solution that meets your specific needs.

The State of Washington will have complete visibility into the state of your Unified Computing System environment and the status of our work through a Management Portal. This advanced reporting technology aggregates select performance, availability, and fault information into real-time daily and monthly reports that show traffic, exceptions, availability, and inventory information for your Cisco Unified Computing System hardware, software, and virtualization technologies. Cisco Unified Computing Remote Management Service can help you to:

- Accelerate the benefits of a Unified Computing System
- Apply best practices and methodologies to assure the successful operation of your unified computing environment
- Optimize the uptime, performance, and efficiency of your Unified Computing System to maximize the value of your investment
- Shape operational processes around a comprehensive view of data center resources and interdependences
- Complement your internal skills and achieve operational efficiencies by leaving the work of monitoring and remediation of unified computing components to Cisco's experts
- Enable quick decisions about your network by providing detailed information and status on the Cisco Remote Management Portal using performance reports, real-time and historical trouble ticket status, and inventory information, 24 hours per day
- Lower total cost of ownership through reduced operating expenses by improving the efficiency of your Cisco Unified Computing System and the staff supporting it

CO-MANAGEMENT APPROACH: WE MONITOR, RESOLVE, AND MANAGE – YOU STAY IN CONTROL

While Remote Management Services monitor and manage the devices in your network 24-hours a day, 7-days a week, The State of Washington will not lose control over your network. This is made possible by setting the appropriate configuration and change management controls so that you and your team still have access to devices and topology control and maintain the ability to monitor who has authority to make changes in the environment. The Cisco co-management approach is unique in an industry where many outsourcing vendors lock you out of your network.

With the Cisco co-managed approach, the Remote Management Services team is an extension of your internal IT staff. We focus on the day-to-day network monitoring and management of your

IT infrastructure, freeing up your qualified IT resources to focus on your core business activities and projects. We allow you to apply technology, not manage it. Our staff takes over the time-consuming day-to-day reactionary network operations for you, while your staff maintains complete real-time visibility and control over your network and the work we do.

With the Remote Management Services, you can improve your staff productivity, reduce your costs, and enable easy adoption of advanced technologies. The services enable IT management staffing simplicity by providing comprehensive monitoring, issue resolution, and day-to-day management of data center technologies.

Remote Management Services offer the following key business and IT benefits.

AVOID STAFFING AND SUPPORT COMPLEXITIES

Remote Management Services are an effective alternative to the State of Washington creating and staffing a fully managed Network Operations Center (NOC); purchasing and maintaining management tools, such as fault polling; event correlation; configuration database and threshold management; developing new processes; and training your staff.

RETAIN CONTROL OF YOUR OWN NETWORK

Remote Management Services are built upon the principles of co-management and out-tasking, and offer a happy medium between complete outsourcing and self-management strategies. The State of Washington decides what services are contracted out instead of whole business processes and you retain control of your own network.

REDUCE DOWNTIME, ENSURE AVAILABILITY AND PERFORMANCE

With Cisco Remote Management Services, The State of Washington can:

- Avoid and quickly resolve network problems.
- Employ proven, industry-leading practices already in use with a broad base of clients.
- Leverage Cisco's deep pool of resources and experience.

LOWER TOTAL COST OF OWNERSHIP

By avoiding the significant costs of dedicated staffing, ongoing training and a mix of network management tools, Remote Management Services customers experience significant savings over the accumulated costs of self management. Further savings are gained by avoiding costly outages and performance issues as a result of our 24/7 proactive monitoring and faster issue resolution, helping ensure the high network availability and reliability.

PROVIDE DETAILED REPORTING

Enable your network administrators to make quick decisions about your network by providing detailed information and status on the Management Portal, including:

- Device level operational status
- Performance reports
- Real-time and historical trouble ticket status
- Inventory information

BENEFIT FROM PROVEN MANAGEMENT LEADERSHIP

RMS is delivered by experienced teams of engineers who monitor and manage your network 24-hours a day, 7-days a week. The services are based on IT Infrastructure Library (ITIL) processes, which include incident management, problem management, service level management, change management, configuration management, and reporting. We provide this service to more than 700 companies spanning all sizes, verticals, and levels of complexities. Key data points include:

- 14+ years experience in providing remote monitoring and management services
- Global presence and support
- 24-hour management support
- Broad range of service offerings for Cisco Advanced Technologies: Data Center, Foundation Technology, Security, Unified Communications, Unified Contact Center, and TelePresence.
- Over 300 service delivery resources.
- Over 300 technical certifications.
- Managing over 60,000 devices in over 76 countries.
- Over 1,500 Unified Communications (UC) servers currently under management

PEOPLE, PROCESSES, AND TOOLS

Successfully managing the Unified Computing System requires a holistic approach that includes a combination of resources—experienced people, proven operational processes, and effective management tools.

People and Skills

Remote Management Services provide 24-hour management support with a dedicated, highly skilled team of more than 300 support and engineering professionals spanning five shifts per 24-hour period.

System administrator staff members hold degrees in computer science or associated technologies, and/or have relevant, extensive work experience relative for the position.

The Remote Management Services practice has over 20 CCIEs on staff with an average of 5 to 10 years experience managing advanced technologies.

Our training strategy is aggressive and designed to develop and evolve the best talent in the marketplace. We allocate additional funds and resource time annually to enable staff to complete technical training and obtain advanced technical certifications. Our staff is compensated on completion of such certifications and, in some cases, must attain specific certifications to be considered for promotion. We have quarterly and annual career plans that are developed with measurable goals for each employee as well.

Our training and recruiting strategy has yielded a world class set of over 300 certifications, including Cisco Certified Internet Engineers (CCIE®) in both routing and switching, security and voice, Cisco Certified Network Professionals (CCNP), Microsoft-certified engineers, Six Sigma process professionals, and PMI-certified project managers.

Remote Management Services has made a significant training investment to deliver world-class support of Unified Computing System. Service delivery engineers have received extensive training on Unified Computing System hardware, operating systems (Windows, Linux, Nexus), and virtualization technologies (VMware).

SERVICE OVERVIEW

Unified Computing Remote Management Service takes full advantage of data center technology expertise, processes, and best-in-class tools to help accelerate the business benefits that are possible from Unified Computing System solutions and lower your Total Cost of Ownership (TCO). The services simplify and accelerate the adoption of this advanced data center technology as it is introduced to the complexity of a network.

Delivered by an experienced team of engineers using industry leading tools and IT Infrastructure Library (ITIL®)-based processes, the Unified Computing Remote Management Service (RMS) provides comprehensive monitoring and management of your Unified Computing System hardware, applications and supporting network infrastructure, 24-hours a day and 7-days a week.

Standard Service

The Standard Service includes remote monitoring, incident management, problem management and service level management for the Unified Computing System. From our Global Network Operations Center (NOC), the team performs the day-to-day monitoring and management activities to resolve incidents, perform root cause analysis on problems, and execute standard changes for the devices and applications in your environment.

The Standard Service also includes a designated Customer Relationship Manager (CRM), serving as your primary business interface and escalation resource. Your CRM will conduct operational audits and schedule monthly, quarterly, and annual reviews with you to discuss performance trends, identify remediation, and develop plans to help ensure the service continues to meet your requirements.

Table 1.   Standard Service Activities and Deliverables

Activities	Deliverables
Remote monitoring ● 24 hour a day, 365 day a year monitoring of Unified Computing System devices, network infrastructure ● Availability and performance monitoring	● Ticket generation ● Incident notification ● Cisco Management Portal for web access to tickets, availability, and performance statistics
Incident Management ● Incident detection, recording, analysis ● Diagnose and resolve incidents ● Review incident and performance trends requiring proactive attention	● Restore service ● Configuration changes to resolve incidents ● Custom incident notifications via email

Activities	Deliverables
Problem Management ● Problem engineering: identification, root cause analysis, resolution ● Ticket trend analysis and problem identification ● Identify recurring Incidents and refer to Incident Management for resolution.	● Restore service ● Configuration changes to resolve problems ● Creation of a Ticket on the Cisco Management Portal for the customer to view. ● Notifications for early warning of pending problems of exceeding performance thresholds ● Leading practice recommendations for server back-ups
Service Level Management ● Operational service audit ● Scheduled operational reviews	● Point of contact for escalations with Customer Relationship Manager (CRM) ● Work session with your Customer Relationship Manager to discuss recommendations resulting from your operational service audit ● Operations Report - Monthly review and summary on the operation of your network, open issues, service history and recommended changes
Reporting	**Standard Top 10 reports** ● Top 10 Talkers on Events ● Top 10 Uptime Devices ● Top 10 Downtime Devices ● Top 10 devices with most P1 tickets ● Top 10 devices with most P2 tickets ● Top 10 devices with most MACs ● 10 Oldest tickets ● Top 10 utilized Ethernet ports on switch ● Top 10 utilized Fibre Channel ports on switch ● Top 10 VM instances that have moved from one blade to another ● Top 10 on CPU utilization, memory utilization, traffic, and disk utilization **VMware reports** ● Virtualization Infrastructure ● Virtualization Server Candidate ● VM Virtualization Projection ● VM Health ● VM Top Utilization ● VM Migration ● VM Interface Utilization ● VM Compliance

Elective Service

The Elective Service goes beyond basic monitoring and management to provide you with flexible options to address specific needs and help ensure optimal performance of your unified computing infrastructure. The Elective Service offers a usage-based block of engineering hours that are used for customer-requested activities and changes to your environment. These scheduled, requested activities range from routine move, add, changes, and deletes (MACDs) to proactive assistance with capacity planning and application configuration.

Table 2.   Elective Change Service Activities and Deliverables

Activities	Deliverables
Change, Configuration, and Patch Management • Work with customer to understand their Change Management process • Provide a process for requesting changes via the Management Portal • Schedule change requests process and login requests via the Management Portal • Maintain a change record visible through the Management Portal • Assess impact of changes • Classify change requests • Create and schedule change requests • Coordinate changes	Changes, configuration updates, and patches have been implemented in their environment • Patches to applications and devices • Configuration changes to Cisco software and devices • Move, add, change, or delete any component of a managed device or application • Configuration analysis • Configuration Manager changes • Provisioning applications and interface
Reporting	**Elective Change Report** - A monthly summary report of elective change hours expended in support of the elective changes requested by the customer.